CLAIMS

1. A method for making a laminate structure comprised of two sheets of base metals comprising the steps of:

    (a) presenting a first sheet of a base metal having a coated surface with a first alloyable metal deposited thereon;

    (b) presenting a second sheet of a base metal having a coated surface with said first alloyable metal deposited thereon;

    (c) placing a sheet of a second alloyable metal between said coated surface of said first and second sheets of base metal to form an unconsolidated structure; then

    (d) applying a first pressure to said first and second sheets of base metal to compress said sheet of second alloyable metal disposed therebetween;

    (e) heating the compressed structure to a phase transition temperature;

    (f) maintaining the compressed structure at the phase transition temperature to form a laminate structure; then

    (g) cooling the laminate structure.

2. A method for making a metallic bond between two or more dissimilar metals comprising the steps of:

    (a) presenting a first base metal member having a coated surface with a first alloyable metal deposited thereon;

(b) presenting a second base metal member that comprises a second base metal that is different than said first base metal, said second base metal member having a coated surface with said first alloyable metal deposited thereon;

(c) placing a sheet of a second alloyable metal between said coated surface of said first and second base metal members to form an unconsolidated structure; then

(d) applying a first pressure to said first and second base metal members to compress said sheet of second alloyable metal disposed therebetween;

(e) heating the compressed structure to a phase transition temperature;

(f) maintaining the compressed structure at the phase transition temperature to form an alloy comprising said first and second alloyable metals between said first and second base metal members; then

(g) cooling the compressed structure, said alloy thereafter forming a metallic bond between said first and second base metal members.

3. A method for making a metallic bond between two dissimilar metals comprising the steps of:

(a) presenting a first base metal member having a coated surface with a first alloyable metal deposited thereon;

(b) presenting a second base metal member that comprises a second base metal that is different than said first base metal, said second base metal being comprised of an alloyable metal;

(c) placing the said coated surface of said first base metal in contact with said second base metal to form an unconsolidated structure; then

(d) forming a compressed structure by applying a first pressure to said first and second base metal members to ensure contact between the alloyable metal consituents;

(e) heating the compressed structure to a phase transition temperature;

(f) maintaining the compressed structure at the phase transition temperature to form an alloy comprising said first and second alloyable metals at the interface between said first and second base metal members; then

(g) cooling the compressed structure, said alloy thereafter forming a metallic bond between said first and second base metal members.

4. The method for making a laminate structure comprised of two sheets of base metals in accordance with Claim 1 wherein said first and second base metals are selected from the group consisting of Fe, Steel, Stainless Steel, Ni, Ti, Al, Mg, Cu, Au, Ag, Pt, Pd, W, Sn, Zn, In, Pb and alloys thereof.

5. The method for making a laminate structure comprised of two sheets of base metals in accordance with Claim 2 wherein said first and second base metals are

selected from the group consisting of Iron and Iron Alloys, Steel Alloys, Stainless Steel Alloys, Nickel and Ni Alloys, Ti and Ti Alloys, Al and Al Alloys, Mg and Mg Alloys, Cu and Cu Alloys, Au, Ag, Pt, Pd, W, Sn, Zn, In, Pb and alloys thereof.